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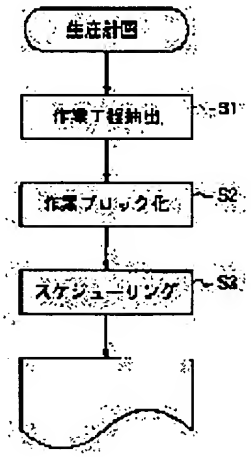
(54) PRODUCTION METHOD FOR SEMICONDUCTOR DEVICE, PRODUCTION MANAGEMENT METHOD/DEVICE FOR THE SEMICONDUCTOR DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a production method for a semiconductor device, especially which can substantially shorten the production lead time of a wafer process, reduce work in process, and supply the semiconductor device in a form which is close to just-in-time.

SOLUTION: A work process for producing respective semiconductor devices is extricate, based on the production plan of the semiconductor device (step S1). Then, the work process is sequentially divided into work blocks which are the group of processes within a prescribed limited time (step S2). Actual scheduling is executed at respective scenes, so that the processing of the respective work blocks is advanced in synchronization with prescribed common reference time divided for respective line ducts at all the scenes in a line.



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CLAIMS

[Claim(s)]
[Claim 1] In each of the time zone which extracts the process for producing a desired semiconductor device, carries out sequential blocking and is divided into an activity block with which the whole processing time becomes less than predetermined time amount for said every predetermined time amount in said extracted process The process of a semiconductor device which processes each process of said the blocked activity block of each, moves an object to the break of said time zone at a latter activity block as a result of the processing concerned, and produces said semiconductor device.
[Claim 2] Blocking of said process which extracted is the process of the existence of the facility used in common at the class of facility used at each process, and two or more processes, the suitable number of wafers to supply to each facility, arrangement of said the facility of each, all the conditions of the number of managers required to manage the blocked process, any one, and the semiconductor device according to claim 1 that are characterized by a certain thing [being, crawling and carrying out based on a gap or plurality].
[Claim 3] The predetermined time amount Y which divides said time zone is the process of the semiconductor device according to claim 1 characterized by asking by the formula 1.
[Equation 1]
Y=(production time in predetermined period)/(the amount of wafers produced during said predetermined period) x (the amount of processing wafers of one time zone) ... (1) [Claim 4] The process for producing a desired semiconductor device is extracted. Said extracted process Sequential blocking is carried out at an activity block with which the whole processing time becomes less than predetermined time amount. So that the time zone divided for said every predetermined time amount may be set up, said each blocked activity block may be appropriately performed for said every time zone and an object may be moved to the break of said time zone by latter activity block as a result of each process concerned The production-control approach of a semiconductor device of managing the production condition of said semiconductor device.
[Claim 5] Blocking of said process which extracted is the existence of the facility used in common at the class of facility used at each process, and two or more processes, the suitable number of wafers to supply to each facility, arrangement of said the facility of each, all the conditions of the number of managers required to manage the blocked process, any one, and the production-control approach of the semiconductor device according to claim 4 characterized by a certain thing [being, crawling and carrying out based on a gap or plurality].
[Claim 6] Said predetermined time amount Y is the production-control approach of the semiconductor device according to claim 4 characterized by asking by the formula 2.
[Equation 2]
Y=(production time in predetermined period)/(the amount of wafers produced during said predetermined period) x (the amount of processing wafers of one time zone) ... (2) [Claim 7] A process extract means to extract the process for producing a desired semiconductor device, The blocking means which carries out sequential blocking of said extracted process at an activity block with which the whole processing time becomes less than predetermined time amount, So that said each blocked activity block may be appropriately performed in each of the time zone divided for said every predetermined time amount and an object may be moved to the break of said time zone by latter activity block as a result of each process concerned Production-control equipment of the semiconductor device which has the management tool which manages the production condition of said semiconductor device.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] About production of the semiconductor integrated circuit of arbitration, especially this invention can shorten a production lead time, and relates to the process of the semiconductor device which can reduce the quantity of an unfinished product and the production-control approach, and equipment of a semiconductor device.
[0002]
[Description of the Prior Art] In recent years, all kinds of electronic circuitry is constituted as a semiconductor device by progress of semiconductor technology and an integration technique, and is included in the device, and it is contributing to improvement in the dependability of a device, and a miniaturization and low-pricing by it. Since a production process is very long and such a semiconductor device has it, its production lead time is usually very as long as one month or more. [complicated] However, recently, the life of a set product is in an ephemeralization inclination, and the demand of wanting you to supply a semi-conductor product timely is increasing. Therefore, the demand is met from the manufacture site of a set product by having a lot of unfinished products (middle inventory) in a production process. In the wafer process which has big effect on a production lead time especially, the semiconductor device is produced in the wafer in the condition that it has a sink and a lot of unfinished products with a large batch lot.
[0003]
[Problem(s) to be Solved by the Invention] However, in the process of a semiconductor device with such a lot of unfinished products, a semiconductor device cannot be produced efficiently as a result, but the improvement is called for.
[0004] For example, the superfluous middle inventory is to be the inclination which packs the same product and is processed so that an output may be raised, in order to collect investment early, since the wafer which equalizes a mechanism loan at the whole process in the wafer process mentioned above since the process is complicated passes, the Ruhr of the direction is not decided above and the price of a manufacturing facility is high, consequently to pour a wafer with a large batch lot, and to have. The wafer lot which pass, and there is not the Ruhr of the direction and are passed in large batch lengthen production lead time further inevitably, and produce the problem that the wafer lot which so separate from a demand forecast will also increase. When a demand forecast once separates, it is also raising the unit price of the semi-conductor product which must carry out defect refund or devaluation of a middle inventory, turns to big loss up, and was appropriately supplied as a result.
[0005] Furthermore, once a product begins a wafer process, priority would be given from the product with a high precision of order-received information, processing will be started, this will confuse a site further, and the problem of generating big dispersion at the long production lead time of a wafer process will also be produced. And production control and grasp of a process capability are made more difficult than these things. Moreover, in the process of such a semiconductor device, supply of the semiconductor device to an end user cannot become the approach that it is carried out roughly and the amount of deliveries is also performed in large quantities at once, either, and cannot supply components appropriately to the set place of business which is going to lessen the inventory of components.
[0006] Therefore, especially the purpose of this invention shortens the production lead time of a wafer process sharply, lessens an unfinished product, and is to offer the process of the semiconductor device which can supply a semiconductor device with the gestalt near just-in-time. Moreover, other purposes of this invention are to offer the production-control approach and equipment of the semiconductor device at the time of production of a semiconductor device which shortens especially the production lead time of a wafer process sharply, lessens an unfinished product, and can supply a semiconductor device with the gestalt near just-in-time.
[0007]

[Means for Solving the Problem] In order to solve said technical problem, each process of a wafer process is classified into the process for every predetermined unit time amount, manufacture processing is performed in each phase on the basis of the unit time amount, and the product was poured at degree process for every unit time amount of the.
[0008] Therefore, the process of the semiconductor device of this invention In each of the time zone which extracts the process for producing a desired semiconductor device, carries out sequential blocking and is divided into an activity block with which the whole processing time becomes less than predetermined time amount for said every predetermined time amount in the extracted process Each process of said the blocked activity block of each is processed, as a result of the processing concerned, an object is moved to the break of said time zone at a latter activity block, and said semiconductor device is produced.
[0009] Moreover, the production-control approach of the semiconductor device of this invention Extract the process for producing a desired semiconductor device, and the extracted process Sequential blocking is carried out at an activity block with which the whole processing time becomes less than predetermined time amount. The time zone divided for said every predetermined time amount is set up, each blocked activity block is appropriately performed for said every time zone, and the production condition of said semiconductor device is managed so that an object may be moved to the break of said time zone by latter activity block as a result of each process concerned.
[0010] Moreover, the production-control equipment of the semiconductor device of this invention A process extract means to extract the process for producing a desired semiconductor device, The blocking means which carries out sequential blocking of said extracted process at an activity block with which the whole processing time becomes less than predetermined time amount, Said each blocked activity block is appropriately performed in each of the time zone divided for said every predetermined time amount, and it has the management tool which manages the production condition of said semiconductor device so that an object may be moved to the break of said time zone by latter activity block as a result of each process concerned.
[0011] The existence of the facility used suitably common to the class of facility which uses blocking of said extracted process at each process, and two or more processes, the suitable number of wafers to supply to each facility, arrangement of said the facility of each, or all the one conditions of the number of managers required to manage the blocked process, it is, it crawls [are,] and it carries out based on a gap or plurality. Specifically, said predetermined time amount Y is found by the formula 3.
[0012]
[Equation 3]
Y=(production time in predetermined period)/(the amount of wafers produced during said predetermined period) x (the amount of processing wafers of one time zone) ... (3) [0013]
[Embodiment of the Invention] The gestalt of 1 implementation of the production-control approach of the semiconductor device of this invention is explained with reference to drawing 1 - drawing 10 . First, the outline of the production-control approach of the semiconductor device of the gestalt of this operation is explained with reference to drawing 1 . Drawing 1 is a flow chart which shows the production-control approach of the semiconductor device. As shown in drawing 1 R> 1, in the gestalt of this operation, to the semiconductor device to produce, processing called an activity extract (step S1), activity blocking (step S2), and scheduling (step S3) is performed, and the production is managed.
[0014] First, based on production planning formed based on the need of a semiconductor device etc., the routing for producing each semiconductor device is extracted (step S1). At this time, the duration of each process, the facility used at each process, and although each process is performed, conditions, such as the efficient number of lots, are also extracted and grasped at coincidence.
[0015] Next, sequential division of the routing is carried out at the activity block which is the ensemble of the process within the predetermined time limit (step S2). Therefore, based on the volume of the wafer of a chip fabrication factory etc., the time limit (this is henceforth called Rhine baton.) is determined first. Supposing the volume of that Rhine is an one-day X lot, it will ask for this Rhine baton by the formula 4.
[0016]
[Equation 4]
(Rhine baton) = (works operation time)/X ... (4) [0017] And each process searched for at step S1 is divided into a block which serves as the processing time within the Rhine baton. At this time, for the block of 1, a process to which processing is advanced by the operator of 1 is summarized, and it blocks to it. Moreover, when there are two or more processes using the same facility, it blocks, considering that all the processes of two or more activity blocks including the process can process within one Rhine baton. Specifically, each [these] activity block is considered as the activity block with allowances. In addition, when it seems that it is better to summarize a part for two or more lots in order to

perform efficiently the process which the processing within the Rhine baton does not end, and its process, after adding a flag to that effect and a comment, it considers as the activity block of one.
[0018] And finally scheduling of the activity actually done in each site is performed (step S3). Actual scheduling is performed in each site so that processing of each activity block may be advanced synchronizing with the predetermined conventional time divided for every common Rhine baton in all the sites in Rhine. Usually, what is necessary is just to process each process of the assigned activity block over the lot of a processing object from the beginning of each Rhine baton period in each site. On the other hand, in the site which has a facility with which the process which uses the facility in two or more activity blocks is set up, in what kind of sequence the activity block of these plurality being performed within the Rhine baton and scheduling are performed. Furthermore, in a site which performs a predetermined activity block ranging over two or more Rhine baton periods, the activity schedule over two or more line baton period in the site etc. is determined based on the situation that a product is offered from a last process etc.
[0019] And based on each schedule determined by doing in this way, production of a semiconductor device is performed in the condition of having been managed appropriately, by doing an activity in each site.
[0020] Next, an example is illustrated and the production-control approach of this semiconductor device is explained. First, if production planning is set up about a certain semiconductor device, in step S1, the production process of the semiconductor device as shown in drawing 2 will be extracted. Each process of drawing 2 in order [process / last] A predetermined mask pattern or a layer, Patterning (LCS.PR), visual inspection of the pattern (LCS.OPT), The automatic check (LCS.MES) of the pattern, night RAIDO etching (SIN.ET), The automatic check (SIN.MES), etching (SN.ET), its visual inspection (SN.OPT), The automatic check (SN.MES), washing (sound power level.WSH) of P well formation process, its patterning (sound power level.PR), its visual inspection (sound power level.OPT), ion implantation (sound power level.II), etc. are expressed.
[0021] Next, the Rhine baton is calculated. In addition, in a wafer process, since two lots (one lot is 25 sheets and 2 lot =2x25 sheet =50 sheet) are processed as a unit in many cases, the Rhine baton shall usually be considered by 2 lot units here. And since it will think on the basis of two lots although the Rhine baton is set to 1.5h from a formula 3 if the number of production lot on the 1st considers as 16 lots, for example, the Rhine baton is set to 3h.
[0022] And if sequential blocking of each process shown in drawing 2 is carried out for every process made within these 3h (180 minutes), it will become like drawing 3 . In addition, this the activity block of each is henceforth carried out to a chitin.
[0023] And scheduling for finally carrying out sequential digestion of the assigned activity within the Rhine baton in each manufacture site is performed. When the facility to be used is used only for one process and there is no holding two or more posts of an activity block, as shown in drawing 4 , what is necessary is just made to process the process which uses the facility of the activity block from the start time of each Rhine baton.
[0024] On the other hand, in the site which has the facility used in common by two or more processes set up in two or more activity blocks, as shown in drawing 5 , time sharing of the Rhine baton period is carried out further, and scheduling of the processing to the site or facility is performed, so that two or more of the processes can be ended within the Rhine baton period. For example, to an expensive facility of IMPURA etc., such scheduling is set up in many cases.
[0025] Moreover, in the site which has the facility which performs batch processing by making into a unit the lot exceeding two lots which are batches, two or more Rhine baton periods which gain the lot of a processing object are extracted, and the decision of the operation schedule of the facility set by it as shows drawing 6 , i.e., the scheduling of processing, is made.
[0026] And production of the semiconductor device is started based on a plan to have carried out scheduling in this way. In each site, the activity block set up like drawing 3 is processed in order within the Rhine baton period, and a back process is provided with the processed intermediate product of a result one by one synchronizing with the Rhine baton period. Such flow of processing is typically shown in drawing 7 . and management of these processings should line-do them based on the Rhine baton period and an activity block to be shown in drawing 8 , using these as a unit -- **.
[0027] In addition, what is necessary is to move the start time of the processing by which scheduling has already been carried out within the Rhine baton period, for example, to create the idle time over a two-line baton period, and just to pour the lot there, as shown in drawing 9 when a small number of lots, such as a lot which Rhine which produces with such a gestalt takes a prototype and emergency, need to be poured. If it does in this way, how to pass the a small number of lot, without affecting production of a main lot can be learned easily.
[0028] Thus, according to the gestalt of this operation, by managing production of a semiconductor device, management of the progress situation of for example, each lot can be easily performed based on the Rhine baton period and an activity block, and easy and fine management is attained with such a gestalt. And since a production lead time (= Rhine baton time amount x activity block count) and the number of the mechanism loans in Rhine (= activity block count) can

be grasped clearly, excessive mechanism loans can be reduced and production lead times can be reduced sharply. as a result of applying this management method to actual Rhine, compared with the conventional approach, both the production lead time and the mechanism, or the number of persons was reducible to 1/2 or less.

[0029] In addition, this invention is not restricted to the gestalt of this operation, and various alterations are possible for it. For example, the production-control approach of the semiconductor device mentioned above can be enforced as equipment with the gestalt of arbitration. To for example, the equipment of a configuration like the usual personal computer which has the I/O section, the storage section, and the data-processing section of arbitration If a management method which memorizes data, such as a production process for every class of semiconductor device, a duration of each process, a facility used at each process, and an arrangement situation of the facility, and was mentioned above is set up as a program An inquiry of a process, formation of an activity block, and processing of scheduling can be made to perform automatically only in inputting the semiconductor device for production.

[0030] Moreover, you may carry out as management equipment of dedication of such processing. Moreover, in such equipment, the output method of the result which carried out scheduling etc. is good by the approach of arbitration. It may be made to carry out the printout of the scheduling result on space, and you may make it display on a display. Moreover, only the scheduling result of a related part is displayed directly on the site of each activity block, and you may make it give a worker support. Moreover, you may make it output a thing like the job instruction to a worker as processes the obtained result further, for example, shows drawing 10 .

[0031]

[Effect of the Invention] As explained above, according to the process of the semiconductor device of this invention, a production lead time can be shortened sharply, the number of unfinished products can be reduced sharply, and a semiconductor device can be produced with the gestalt near just-in-time. Moreover, if the production-control approach of the semiconductor device of this invention and its equipment are used, a production lead time can be shortened sharply, the number of unfinished products can be reduced sharply, and production of a semiconductor device can be managed so that a semiconductor device can be supplied with the gestalt near just-in-time.

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention] About production of the semiconductor integrated circuit of arbitration, especially this invention can shorten a production lead time, and relates to the process of the semiconductor device which can reduce the quantity of an unfinished product and the production-control approach, and equipment of a semiconductor device.

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PRIOR ART

[Description of the Prior Art] In recent years, all kinds of electronic circuitry is constituted as a semiconductor device by progress of semiconductor technology and an integration technique, and is included in the device, and it is contributing to improvement in the dependability of a device, and a miniaturization and low-pricing by it. Since a production process is very long and such a semiconductor device has it, its production lead time is usually very as long as one month or more. [complicated] However, recently, the life of a set product is in an ephemeralization inclination, and the demand of wanting you to supply a semi-conductor product timely is increasing. Therefore, the demand is met from the manufacture site of a set product by having a lot of unfinished products (middle inventory) in a production process. In the wafer process which has big effect on a production lead time especially, the semiconductor device is produced in the wafer in the condition that it has a sink and a lot of unfinished products with a large batch lot.

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EFFECT OF THE INVENTION

[Effect of the Invention] As explained above, according to the process of the semiconductor device of this invention, a production lead time can be shortened sharply, the number of unfinished products can be reduced sharply, and a semiconductor device can be produced with the gestalt near just-in-time. Moreover, if the production-control approach of the semiconductor device of this invention and its equipment are used, a production lead time can be shortened sharply, the number of unfinished products can be reduced sharply, and production of a semiconductor device can be managed so that a semiconductor device can be supplied with the gestalt near just-in-time.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, in the process of a semiconductor device with such a lot of unfinished products, a semiconductor device cannot be produced efficiently as a result, but the improvement is called for.

[0004] For example, the superfluous middle inventory is to be the inclination which packs the same product and is processed so that an output may be raised, in order to collect investment early, since the wafer which equalizes a mechanism loan at the whole process in the wafer process mentioned above since the process is complicated passes, the Ruhr of the direction is not decided above and the price of a manufacturing facility is high, consequently to pour a wafer with a large batch lot, and to have. The wafer lot which pass, and there is not the Ruhr of the direction and are passed in large batch lengthen production lead time further inevitably, and produce the problem that the wafer lot which so separate from a demand forecast will also increase. When a demand forecast once separates, it is also raising the unit price of the semi-conductor product which must carry out defect refund or devaluation of a middle inventory, turns to big loss up, and was appropriately supplied as a result.

[0005] Furthermore, once a product begins a wafer process, priority would be given from the product with a high precision of order-received information, processing will be started, this will confuse a site further, and the problem of generating big dispersion at the long production lead time of a wafer process will also be produced. And production control and grasp of a process capability are made more difficult than these things. Moreover, in the process of such a semiconductor device, supply of the semiconductor device to an end user cannot become the approach that it is carried out roughly and the amount of deliveries is also performed in large quantities at once, either, and cannot supply components appropriately to the set place of business which is going to lessen the inventory of components.

[0006] Therefore, especially the purpose of this invention shortens the production lead time of a wafer process sharply, lessens an unfinished product, and is to offer the process of the semiconductor device which can supply a semiconductor device with the gestalt near just-in-time. Moreover, other purposes of this invention are to offer the production-control approach and equipment of the semiconductor device at the time of production of a semiconductor device which shortens especially the production lead time of a wafer process sharply, lessens an unfinished product, and can supply a semiconductor device with the gestalt near just-in-time.

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MEANS

[Means for Solving the Problem] In order to solve said technical problem, each process of a wafer process is classified into the process for every predetermined unit time amount, manufacture processing is performed in each phase on the basis of the unit time amount, and the product was poured at degree process for every unit time amount of the.
[0008] Therefore, the process of the semiconductor device of this invention In each of the time zone which extracts the process for producing a desired semiconductor device, carries out sequential blocking and is divided into an activity block with which the whole processing time becomes less than predetermined time amount for said every predetermined time amount in the extracted process Each process of said the blocked activity block of each is processed, as a result of the processing concerned, an object is moved to the break of said time zone at a latter activity block, and said semiconductor device is produced.
[0009] Moreover, the production-control approach of the semiconductor device of this invention Extract the process for producing a desired semiconductor device, and the extracted process Sequential blocking is carried out at an activity block with which the whole processing time becomes less than predetermined time amount. The time zone divided for said every predetermined time amount is set up, each blocked activity block is appropriately performed for said every time zone, and the production condition of said semiconductor device is managed so that an object may be moved to the break of said time zone by latter activity block as a result of each process concerned.
[0010] Moreover, the production-control equipment of the semiconductor device of this invention A process extract means to extract the process for producing a desired semiconductor device, The blocking means which carries out sequential blocking of said extracted process at an activity block with which the whole processing time becomes less than predetermined time amount, Said each blocked activity block is appropriately performed in each of the time zone divided for said every predetermined time amount, and it has the management tool which manages the production condition of said semiconductor device so that an object may be moved to the break of said time zone by latter activity block as a result of each process concerned.
[0011] The existence of the facility used suitably common to the class of facility which uses blocking of said extracted process at each process, and two or more processes, the suitable number of wafers to supply to each facility, arrangement of said the facility of each, or all the one conditions of the number of managers required to manage the blocked process, it is, it crawls [are,] and it carries out based on a gap or plurality. Specifically, said predetermined time amount Y is found by the formula 3.
[0012]
[Equation 3]
Y=(production time in predetermined period)/(the amount of wafers produced during said predetermined period) x (the amount of processing wafers of one time zone) ... (3) [0013]
[Embodiment of the Invention] The gestalt of 1 implementation of the production-control approach of the semiconductor device of this invention is explained with reference to drawing 1 - drawing 10 . First, the outline of the production-control approach of the semiconductor device of the gestalt of this operation is explained with reference to drawing 1 . Drawing 1 is a flow chart which shows the production-control approach of the semiconductor device. As shown in drawing 1 R> 1, in the gestalt of this operation, to the semiconductor device to produce, processing called an activity extract (step S1), activity blocking (step S2), and scheduling (step S3) is performed, and the production is managed.
[0014] First, based on production planning formed based on the need of a semiconductor device etc., the routing for producing each semiconductor device is extracted (step S1). At this time, the duration of each process, the facility used at each process, and although each process is performed, conditions, such as the efficient number of lots, are also extracted and grasped at coincidence.

[0015] Next, sequential division of the routing is carried out at the activity block which is the ensemble of the process within the predetermined time limit (step S2). Therefore, based on the volume of the wafer of a chip fabrication factory etc., the time limit (this is henceforth called Rhine baton.) is determined first. Supposing the volume of that Rhine is an one-day X lot, it will ask for this Rhine baton by the formula 4.
[0016]
[Equation 4]
(Rhine baton) = (works operation time)/X ... (4) [0017] And each process searched for at step S1 is divided into a block which serves as the processing time within the Rhine baton. At this time, for the block of 1, a process to which processing is advanced by the operator of 1 is summarized, and it blocks to it. Moreover, when there are two or more processes using the same facility, it blocks, considering that all the processes of two or more activity blocks including the process can process within one Rhine baton. Specifically, each [these] activity block is considered as the activity block with allowances. In addition, when it seems that it is better to summarize a part for two or more lots in order to perform efficiently the process which the processing within the Rhine baton does not end, and its process, after adding a flag to that effect and a comment, it considers as the activity block of one.
[0018] And finally scheduling of the activity actually done in each site is performed (step S3). Actual scheduling is performed in each site so that processing of each activity block may be advanced synchronizing with the predetermined conventional time divided for every common Rhine baton in all the sites in Rhine. Usually, what is necessary is just to process each process of the assigned activity block over the lot of a processing object from the beginning of each Rhine baton period in each site. On the other hand, in the site which has a facility with which the process which uses the facility in two or more activity blocks is set up, in what kind of sequence the activity block of these plurality being performed within the Rhine baton and scheduling are performed. Furthermore, in a site which performs a predetermined activity block ranging over two or more Rhine baton periods, the activity schedule over two or more line baton period in the site etc. is determined based on the situation that a product is offered from a last process etc.
[0019] And based on each schedule determined by doing in this way, production of a semiconductor device is performed in the condition of having been managed appropriately, by doing an activity in each site.
[0020] Next, an example is illustrated and the production-control approach of this semiconductor device is explained. First, if production planning is set up about a certain semiconductor device, in step S1, the production process of the semiconductor device as shown in drawing 2 will be extracted. Each process of drawing 2 in order [process / last] A predetermined mask pattern or a layer, Patterning (LCS.PR), visual inspection of the pattern (LCS.OPT), The automatic check (LCS.MES) of the pattern, night RAIDO etching (SIN.ET), The automatic check (SIN.MES), etching (SN.ET), its visual inspection (SN.OPT), The automatic check (SN.MES), washing (sound power level.WSH) of P well formation process, its patterning (sound power level.PR), its visual inspection (sound power level.OPT), ion implantation (sound power level.II), etc. are expressed.
[0021] Next, the Rhine baton is calculated. In addition, in a wafer process, since two lots (one lot is 25 sheets and 2 lot =2x25 sheet =50 sheet) are processed as a unit in many cases, the Rhine baton shall usually be considered by 2 lot units here. And since it will think on the basis of two lots although the Rhine baton is set to 1.5h from a formula 3 if the number of production lot on the 1st considers as 16 lots, for example, the Rhine baton is set to 3h.
[0022] And if sequential blocking of each process shown in drawing 2 is carried out for every process made within these 3h (180 minutes), it will become like drawing 3 . In addition, this the activity block of each is henceforth carried out to a chitin.
[0023] And scheduling for finally carrying out sequential digestion of the assigned activity within the Rhine baton in each manufacture site is performed. When the facility to be used is used only for one process and there is no holding two or more posts of an activity block, as shown in drawing 4 , what is necessary is just made to process the process which uses the facility of the activity block from the start time of each Rhine baton.
[0024] On the other hand, in the site which has the facility used in common by two or more processes set up in two or more activity blocks, as shown in drawing 5 , time sharing of the Rhine baton period is carried out further, and scheduling of the processing to the site or facility is performed, so that two or more of the processes can be ended within the Rhine baton period. For example, to an expensive facility of IMPURA etc., such scheduling is set up in many cases.
[0025] Moreover, in the site which has the facility which performs batch processing by making into a unit the lot exceeding two lots which are batches, two or more Rhine baton periods which gain the lot of a processing object are extracted, and the decision of the operation schedule of the facility set by it as shows drawing 6 , i.e., the scheduling of processing, is made.
[0026] And production of the semiconductor device is started based on a plan to have carried out scheduling in this way. In each site, the activity block set up like drawing 3 is processed in order within the Rhine baton period, and a back

process is provided with the processed intermediate product of a result one by one synchronizing with the Rhine baton period. Such flow of processing is typically shown in drawing 7 . and management of these processings should line-do them based on the Rhine baton period and an activity block to be shown in drawing 8 , using these as a unit -- **.
[0027] In addition, what is necessary is to move the start time of the processing by which scheduling has already been carried out within the Rhine baton period, for example, to create the idle time over a two-line baton period, and just to pour the lot there, as shown in drawing 9 when a small number of lots, such as a lot which Rhine which produces with such a gestalt takes a prototype and emergency, need to be poured. If it does in this way, how to pass the a small number of lot, without affecting production of a main lot can be learned easily.
[0028] Thus, according to the gestalt of this operation, by managing production of a semiconductor device, management of the progress situation of for example, each lot can be easily performed based on the Rhine baton period and an activity block, and easy and fine management is attained with such a gestalt. And since a production lead time (= Rhine baton time amount x activity block count) and the number of the mechanism loans in Rhine (= activity block count) can be grasped clearly, excessive mechanism loans can be reduced and production lead times can be reduced sharply. as a result of applying this management method to actual Rhine, compared with the conventional approach, both the production lead time and the mechanism, or the number of persons was reducible to 1/2 or less.
[0029] In addition, this invention is not restricted to the gestalt of this operation, and various alterations are possible for it. For example, the production-control approach of the semiconductor device mentioned above can be enforced as equipment with the gestalt of arbitration. To for example, the equipment of a configuration like the usual personal computer which has the I/O section, the storage section, and the data-processing section of arbitration If a management method which memorizes data, such as a production process for every class of semiconductor device, a duration of each process, a facility used at each process, and an arrangement situation of the facility, and was mentioned above is set up as a program An inquiry of a process, formation of an activity block, and processing of scheduling can be made to perform automatically only in inputting the semiconductor device for production.
[0030] Moreover, you may carry out as management equipment of dedication of such processing. Moreover, in such equipment, the output method of the result which carried out scheduling etc. is good by the approach of arbitration. It may be made to carry out the printout of the scheduling result on space, and you may make it display on a display. Moreover, only the scheduling result of a related part is displayed directly on the site of each activity block, and you may make it give a worker support. Moreover, you may make it output a thing like the job instruction to a worker as processes the obtained result further, for example, shows drawing 10 .
[0031]

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is a flow chart for explaining the production-control approach of the semiconductor device of the gestalt 1 operation of this invention.
[Drawing 2] It is drawing showing the example of the production process for producing the extracted semiconductor device.
[Drawing 3] It is drawing showing the condition that each process shown in drawing 2 was blocked.
[Drawing 4] In each facility, it is drawing for explaining the scheduling condition of the usual activity.
[Drawing 5] It is drawing for explaining the scheduling condition of an activity in the case of using the same facility in common at two or more processes of two or more activity blocks.
[Drawing 6] One batch processing is drawing for explaining the scheduling condition of an activity to processing which exceeds an one-line baton period.
[Drawing 7] It is drawing showing typically the process which made the activity block the unit.
[Drawing 8] It is drawing showing the example in which the production condition of a semiconductor device is managed on the basis of the activity block and the Rhine baton.
[Drawing 9] a prototype 7 -- it is drawing for explaining the scheduling condition of an activity when interruption of which a small number of lot arises.
[Drawing 10] It is drawing showing the example of an operator's working-hours rate created based on the scheduling result.

[Translation done.]

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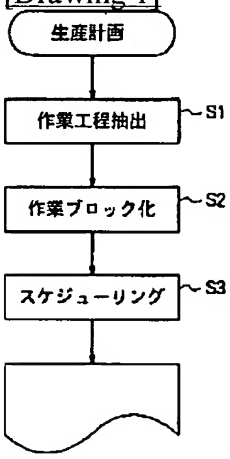
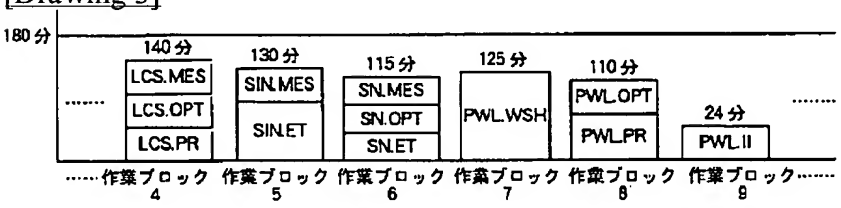
DRAWINGS

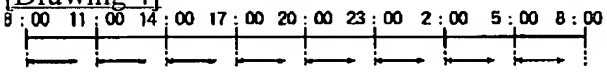
[Drawing 1]



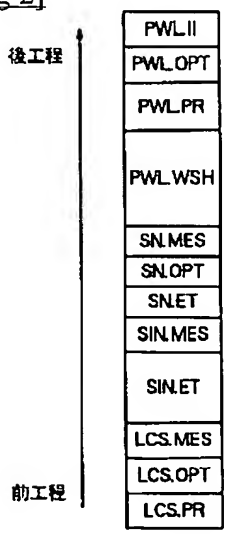
[Drawing 3]



[Drawing 4]

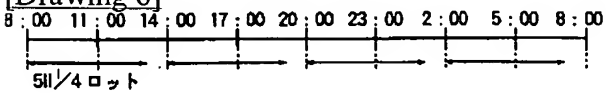


[Drawing 2]

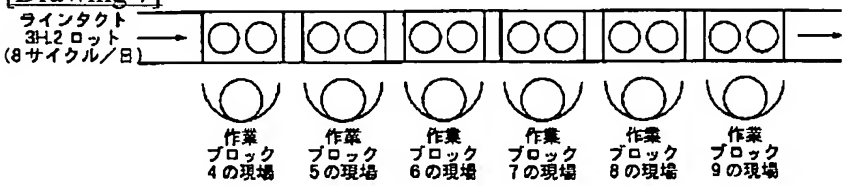


[Drawing 5]

[Drawing 6]

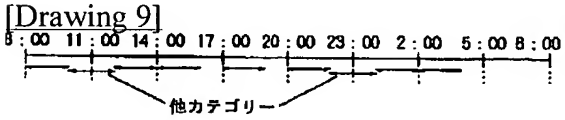


[Drawing 7]

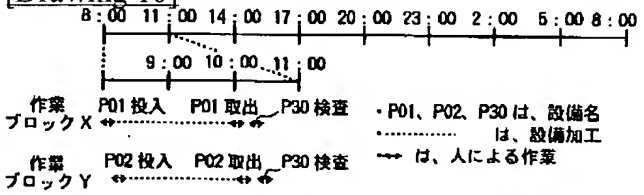


[Drawing 8]

[Drawing 9]



[Drawing 10]



[Translation done.]